

REPRINTS OF RARE ARTICLES ON MOLLUSCA. -- D. H. BARNES, 1823, "On the Genera Unio and Alasmodonta; with Introductory Remarks." --- American Journal of Science, vol. 6, No. 2, pp. 258-280, pls. 1-8, 11-13.

Reprinted with permission of the Editor of the American Journal of Science, Dr. John Rodgers. -- The First part of this article appeared in STERKIANA No. 6, pp. 40-51, February, 1962.

NOTE. The original paper is accompanied by eleven plates which have been re-arranged into six for this reprint because of the difference in format between the American Journal of Science and STERKIANA. Descriptions of the reprinted plates include indication of the figures on each original plate. The editor regrets that reproduction of the plates was imperfect due to the fact that plates in all available copies of the original paper had been trimmed in binding and were so tightly bound into the book that the left-hand margin of some figures is indistinct or cut off. The reproductions appear to be sufficiently clear, however, to give an idea of the look of the originals and to allow the reader to see what Barnes had in hand when he prepared his work.

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CONCHOLOGY

VIII. - On the Genera Unio and Alasmodonta; with Introductory Remarks: by D. Barnes, M. A. Member of the New-York Academy of Natural History. °

(Concluded from pa. 127.)

UNIO

External teeth moderately thick, direct.

OBSERVATIONS

The shells of this section are, in general, very thick. They have the beaks slightly depressed, or nearly flat. The

(Read before the Lyceum.)

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external surface is neither waved nor tuberculated. The teeth are less sulcated than those of the former, and only crenulated, or striated, generally triangular and elevated, and, in magnitude, bear a proportion to the thickness of the shell. The cavity of the beaks is small, or none, and neither angular nor compressed. The shells have a smooth and regular appearance, and five of the seven species have the inside purple.

SPECIES

10. UNIO ELLIPTICUS. Fig. 19.

- a. outline
- b. of
- c. four
- d. sizes

Shell regularly oval, thick, convex, glabrous, beaks depressed. Teeth elevated, triangular, striated.

Unio Crassus. Mr. Say. Plate 1 fig. 8?
Mya Compladata? Dillwyn. page 51.

Inhabits Fox River. Mr. Schoolcraft.

Dr. Mitchell's Cabinet.

My Collection.

Diam. 1.0 - 2.0 Length 1.7 - 3.2 Breadth 2.5 - 4.9 inches. Shell long before, and short behind, equally rounded at both extremities; beaks nearly flat; ligament elevated above the beaks; epidermis yellowish brown, obscurely rayed, rays disappearing in old specimens; slightly flattened on the anterior slope; teeth deeply divided, elevated, finely striated; anterior cicatrix wrinkled; posterior rough; cavity of the beaks considerable. Naker pearly white, iridescent, and sometimes, of a beautiful flesh colour.

11. UNIO CARINATUS. Fig. 10 ^{a.} inside. _{b.} outside.

Shell oblong oval, biangulate before, rayed, hinge margin straight, compressed, keel-shaped, teeth finely striate.

Inhabits Fox River. Mr. Schoolcraft.

Dr. Mitchell's Cabinet.

My Collection.

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Diam. .7 - 1.3 Length 1.2 - 2.3 Breadth 2.1 - 3.7 inches.

Shell transversely elongated, sub-pentangular, moderately thick, rounded behind; beaks slightly elevated, approximate; hinge margin straight, elevated, compressed, keel-shaped, longitudinally furrowed, fuscous with submembranaceous striae; anterior dorsal margin straight and sub-truncate; basal margin rounded; epidermis greenish yellow, with broad dark green rays; surface glabrous. Cardinal teeth slightly striated, nearly smooth; posterior cicatrix deep and striated; naker very white, iridescent.

Variety (a) obscurely rayed, more convex, compressed on the base, and gaping behind.

Inhabits Lake Champlain.

My Collection.

REMARKS. -- This is a beautiful species. It cannot be confounded with any of the varieties of the *Cariosus* or *Radiatus*, on account of the primary teeth, which are entirely different.

We have so many specimens of this shell, and they are all so perfectly characterized, and so much alike, that there can be no doubt of its being entitled to a distinct appellation. In several of the specimens, the epidermis is worn exhibiting a flesh-coloured substance beneath.

12. UNIO ALATUS. -- Shell ovately triangular, hinge margin elevated into a large wing, valves growing together on the back of the ligament, inside purple.

Unio Alatus. Mr. Say.

Unio Alata. M. Lamarck.

American Conchology, plate 4. fig. 2.

Inhabits Fox River. Mr. Schoolcraft.

Wisconsin. Capt. Douglass.

Cabinets of the Lyceum and Dr. Mitchell's.

We have every size of this shell from one inch to six inches and nine tenths broad. A large grown specimen measures as follows, viz.

Diam. 2.0 Length 4.7 Breadth 6.9

A middle aged and very splendid specimen measures D. 1.6 L. 4.0 B. 6.0

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Shell moderately thick; disks flat and compressed, long before and short behind; beaks compressed; ligament concealed within the valves; hinge margin very much elevated and compressed; basal margin nearly straight; anterior dorsal margin incurved or emarginate; anterior margin rounded and broad; posterior margin rounded and narrow; surface deeply wrinkled. Teeth elevated and crenate; anterior cicatrix very broad; posterior composed of three distinct impressions, two small ones before the large one, and also a row of very small impressions across the cavity of the beaks, before the cardinal tooth. Naker red-purple and very brilliant; cavity of the beaks small and indented with from six to ten minute impressions in a row nearly longitudinal.

REMARKS. -- The hinge margin is less elevated, and the colour less brilliant, in old than in young and middle aged specimens. The former approach the regular oval form, the latter are broad ovate.

None of the specimens in our collections

exhibit the character mentioned by Mr. Say, viz. "the external laminated tooth obsolete, only one in each valve being perceptible;" and the tubercles, mentioned by him on the inside, appear only in very old specimens.

M. Le Sueur thinks that the remarkable union of the valves above the ligament ought to characterize a distinct genus. This union can seldom be observed in Cabinet specimens, as the part is very fragile. Of the numerous specimens in our collections, one only retains the full elevation of the wing; the rest having been broken in transportation. This is the most splendid species of the *Unio* yet known, and it is so remarkably characterized as readily to be distinguished from all others, except perhaps the *Unio Gracilis*; which, though perfectly distinct, might, at first view, be mistaken for the young of this species.

13. *UNIO PRAELONGUS*. Fig. 11 {outline of three sizes.

Shell much elongated transversely, narrow, thick, tumid, beaks flat; lateral tooth long, thin; inside purple.

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Unio purpurata? M. Lamarck.

Inhabits Fox River. Mr. Schoolcraft.

Wisconsin. Capt. Douglass.

Cabinets of the Lyceum and Dr. Mitchill.

My Collection.

Diam. 1.7 - 2.1 Length 2.5 - 2.7 Breadth 5.8 - 6.4

Shell very long oval; anterior side somewhat pointed, posterior side short, rounded, obtuse; beaks depressed; ligament elevated above the beaks; basal margin slightly compressed, shortened, or, in old specimens, arcuated; in young rounded; epidermis blackish brown, with fine interrupted wrinkles placed in longitudinal rows, having somewhat the appearance of striae.

Young specimens are rayed with yellowish olive, and have the epidermis smooth and glabrous. Naker purple of different shades according to the age or perfection of the specimen, sometimes tinged with irregular spots of greenish, particularly under the beaks, with a row of small muscular impressions in the cavity.

REMARKS. -- This shell is probably the *Unio purpurata* of M. Lamarck. (See introductory remarks.) We have every size from the breadth of one inch, to six inches and four lines.

Variety (a) Shell on the inside striated longitudinally. Naker red-purple, very splendid.

Variety (b) Naker whitish green on the margin, and purple in the centre. An uncommonly beautiful shell, tinged with copper?

My Collection.

14. *UNIO GIBBOSUS*. Fig. 12. {a. inside, b. outside.

Shell elongated transversely, thick, gibbous; lateral tooth very thick, incurved, inside purple.

Inhabits Wisconsin. Mr. Schoolcraft.

My collection. Lyceum's Cabinet.

Mr. Say's Collection. Philadelphia.

Diam. .75-1.3 Length 1.15-1.9 Breadth 24-4.0

Shell much elongated transversely, thick and heavy, rapidly narrowed and rostrate before, narrow and rounded be-

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hind, sub-cylindrical, disks somewhat compressed; anterior side very much produced; beaks flat; ligament elevated; anterior dorsal margin depressed and flattened; basal margin nearly straight; epidermis blackish brown, finely striated and deeply wrinkled transversely; naker purple of different shades, often with a purple centre and white margin. Teeth crenate; lateral tooth rough, very thick, bending downward, terminating abruptly and folded over towards the interior of the shell.

REMARKS. -- This shell in many respects resembles the preceding, but it differs from it in being less, thicker in proportion to the size, more attenuated before; and it may be distinguished from all others by the unusual thickness of the lateral tooth. It is also more depressed immediately behind the beaks, and the thickness of the anterior part of the shell is very unusual, being in some specimens greater than that of the posterior. In one specimen the lateral tooth of the left valve measures two lines in thickness, and the channel of the opposite valve is two and a half lines broad.

15. UNIO CUNEATUS. -- Shell ovate, wedge-shaped, thick, gibbous; disks swelled, anterior lunule furrowed; lateral tooth thin; inside purple.

not very thick; cicatrices deep; cavity of the beaks small and not angular; naker brownish purple, iridescent.

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Inhabits the Ohio. Mr. S. B. Collins.

Mr. Collins's collection.

Diam. 1.6 Length 2.3 Breadth 3.8

Shell elongated and sub-triangular, thick and ponderous; anterior side narrowed, thin, angulated, wedge-shaped, compressed; umbones large and somewhat elevated; beaks low and distant; anterior lunule long-heart-shaped, large, distinct with an elevated ridge and longitudinally furrowed; posterior lunule small and deep; basal margin slightly rounded; anterior margin narrow and angulated; anterior dorsal, rapidly narrowed; posterior dorsal impressed; epidermis blackish brown, somewhat ferruginous; surface finely wrinkled, an elevated ridge extends from the beaks to the anterior basal margin, and terminates in an angle on the fore part. Cardinal teeth deeply divided and sulcated; lateral tooth long, curved, and

REMARKS. -- This shell differs from the foregoing one, in its outline, in its greater length, less breadth, and in being more triangular. In that the lunules are not distinct; in this they are strongly marked. The lateral teeth of the two differ in length, thickness, direction and surface. This shell, if the thickness only were observed, might be mistaken for a variety of the *Crassus*; but the teeth are totally different.

16. UNIO PURPUREUS. -- Shell not very thick, obliquely sub-truncate before; beaks depressed; epidermis without rays, glossy;

Unio Purpureus. Mr. Say.

Unio Purpurascens. M. Lamarck.

Unio Rarisulcata ? } M. Lamarck.

Unio Coarctata ? }

EXPLANATION OF PLATE 1, OPPOSITE PAGE

Unio Crassus (two left-hand figures). Page 118 of original text.
Plate 1, Figs. 1a and b of original. The figures have been cut off slightly because of tight binding of the plate copied.

Unio Undulatus (two right-hand figures). Page 120 of original text.
Plate 2, Figs. 2a and b of original. The figures have been cut off slightly because of tight binding of the plate copied.



Alcio Nudulatus.



Alcio Crassus.



Unio Rhombula? }
 Unio Carinifera? } M. Lamarck.
 Unio Georgiana? }

American Conchology, Plate 3, Fig. 1.
 Inhabits Lakes and Rivers eastward of the Alleghany mountains.

Cabinet of the Lyceum. My collection.

The varieties, which are exceedingly numerous, differ very much from each other in the length of the diameter, some measuring 13 lines, and some only 5. The length and breadth are generally in the proportions of 3 to 5. Mr. Say's figure measures length 1.4, breadth 2.6, and many specimens are twice as broad as they are long.

Diameter 1.3. Length 2.5. Breadth 4.5.

Inhabits Stony Creek, near Princeton, N. J. Mr. Sears.

| | | | |
|------------------------------|-----|-----|------|
| | 1.1 | 1.8 | 3.45 |
| Inhabits the Kayaderosseras. | | | |
| | .75 | 1.5 | 3.0 |

Inhabits the Housatonick.

Shell sub-oval, ovate-oblong, ovate - rhomboidal, oblong-ovate; thin, or not very thick; disks convex, convex-depressed, or somewhat compressed; before somewhat angulated or rounded obliquely; base rounded, straight, a little shortened, depressed, sub-sinuate, or coarctate-sinuate; beaks not prominent; hinge margin elevated, compressed,

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carinate or depressed; epidermis has generally a silky lustre; surface with smaller wrinkles placed between larger ones, or with transverse elevated distant furrows, or smooth; cardinal teeth small, or not very large, sulcated or striated; beaker livid, cerulean, green, purple, red, violet, white, with various shades and mixtures of these colors; no cavity under the beaks.

REMARKS. -- The terms of the foregoing description are taken from Mr. Say's and from the six species of M. Lamarck mentioned above. This is a very common shell, of a regular and uniform appearance, without prominence of parts, or strongly marked characters; which perhaps induced M. Lamarck to say "it is nothing

remarkable." * Amidst a variety almost infinite, like that of the human countenance, there is still a characteristic identity of this species, which can scarcely be mistaken by an experienced observer. One variety of the Radiatus from the Saratoga Lake approaches nearest to this species, but the least appearance of rays forbids this association.

** Cardinal teeth small, direct.

17. UNIO RADIATUS. -- Shell broad-ovate, thin, finely striated, glossy rayed, within bluish white, or tinged with red.

Unio Ochraceous. Mr. Say.

Mya Radiata. Mr. Dillwyn.

Unio Radiata. M. Lamarck.

American Conchology, plate 2, fig. 8.

Inhabits lakes and rivers of North-America.

Cabinet of the Lyceum. My collection.

Diam. .6-.9 Length 1.2-1.5 Breadth 2.0-2.5.

Shell with the anterior side broad, thin and fragile, disks in old specimens somewhat convex; in young, depressed; beaks slightly elevated and approximate; ligament elevated; hinge margin elevated, compressed, carinate; basal margin commonly a little depressed, and sometimes arcuated; anterior margin narrow; posterior broad; anterior dorsal sub-truncate; epidermis greenish yellow or olive-brown, rayed with dark green, and very finely striated trans

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versely; surface smooth and shining. Cardinal teeth crenulated, cavity of the beaks small; naker bluish white, or reddish yellow; surface smooth and pearly.

Variety (a) very obscurely rayed and much like Unio Purpureus in shape.

Inhabits Saratoga Lake.

Variety (b) oval or very nearly as broad behind as before.

Inhabits the Wisconsin. Capt. Douglas.

* See An. Sans Vertebres, Vol. VI, p. 74, U. Georgina.

18. UNIO MUCRONATUS. } outline of
 Fig. 13. } the shell
 Shell ovate, broader behind; base compressed,
 falcated; beaks small, elevated, acute, in-
 side purple.

Inhabits the Wisconsin. Capt. Douglass.
 My Collection.

Diam. .7 Length 1.3 Breadth 2.3

Shell ovate, moderately thick, produced,
 narrowed, and compressed before; rounded and
 broad behind; disks compressed; anterior lunule
 long, distinct, with a marginal furrow; poste-
 rior lunule small, deeply impressed; hinge mar-
 gin rounded; basal margin arcuated; anterior
 dorsal rapidly narrowed and slightly emargi-
 nate; epidermis horn-color, and obscurely ray-
 ed; surface smooth; cardinal teeth serrate sul-
 cate; cicatrices deep; naker purplish on the
 margin, and whitish in the centre.

REMARKS. -- This species has somewhat the
 outline of the *Unio Tuberculatus*, but the out-
 side is smooth. The individual above descri-
 bed is probably not more than half grown, as
 the umbones are very little eroded.

19. UNIO INFLATUS. -- Shell oval, thick, tu-
 mid, beaks broad, obtuse behind, wedge-shaped
 before, inside pearly white.

Inhabits the Wisconsin and Lake Erie. Capt.
 Douglass.
 Dr. Mitchill's Cabinet.
 My collection.

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Diam. 1.4 Length 1.7 Breadth 3.2.

Shell about equally broad before and behind,

thick and very much swelled, the diameter be-
 ing almost equal to the length; beaks broad round
 and somewhat elevated; posterior side very short
 and obtuse; anterior side wedge-shaped produced.
 Hinge margin nearly straight, and parallel to the
 base; basal margin straight and slightly compres-
 sed in the middle; epidermis yellowish-green,
 rayed; surface wrinkled and striated transversely.
 cardinal teeth elevated, pointed, sulcated; later-
 al teeth papillous; posterior cicatrix deep, and
 somewhat rayed with elevated lines; cavity of
 the beaks moderate; naker pearly white and ir-
 rescent; internal surface papillous.

REMARKS. -- This shell is less than the *Unio*
Siliquoides, and also more rounded and gibbous
 shorter behind and proportionally longer before
 than that species. The varieties of the two spe-
 cies approach each other, and are to be distin-
 guished only by the teeth.

B. TEETH OBLIQUE.

**** Cardinal teeth, broad, oblique, compressed.

20. UNIO VENTRICOSUS. Fig. 14. { a small size
 b large size
 c the firm
 variety.

Shell large thick triangularly ovate, convex; um-
 bones large, round, prominent; beaks recurved;
 cavity capacious.

Mya Radiata. Dillwyn's Letter to Dr. Mitchill
Unio Cariosus. Mr. Say's Letter to the Author
 Inhabits the Wisconsin. Mr. Schoolcraft.

EXPLANATION OF PLATE 2, OPPOSITE PAGE

Unio Plicatus (top left-hand figures). Page 120 of original text.

Plate 3, Figs. 3a and b of original.

UNIO Undatus (top central two figures). Page 121 of original text.

Plate 4, Figs. 4a and b of original.

Unio Cornutus (top right-hand three figures). Page 122 of original text.

Plate 4, Figs. 5a, b, c, of original.

Unio Verrucosus (bottom two figures). Page 123 of original text.

Plate 5, Fig. 6 of original.

PLATE 2

Fig. 3

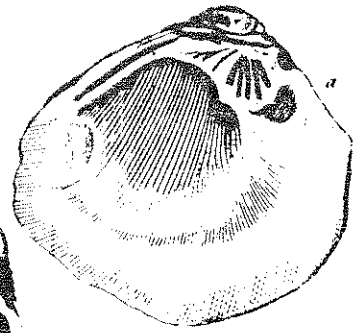


Fig. 4. pa. 121.

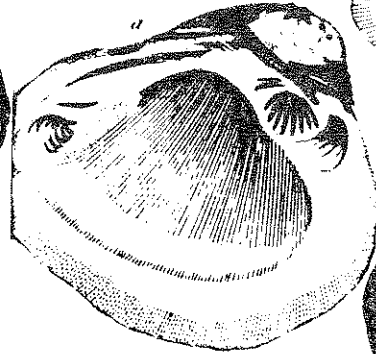
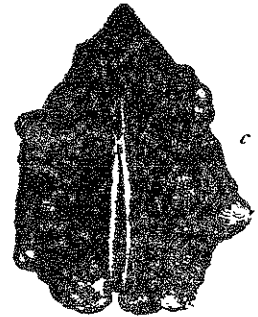
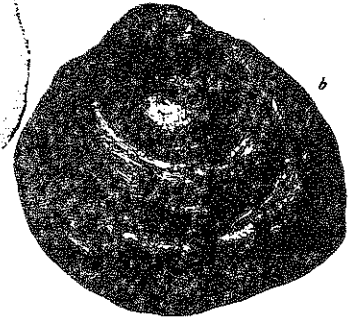


Fig. 3. pa. 120.

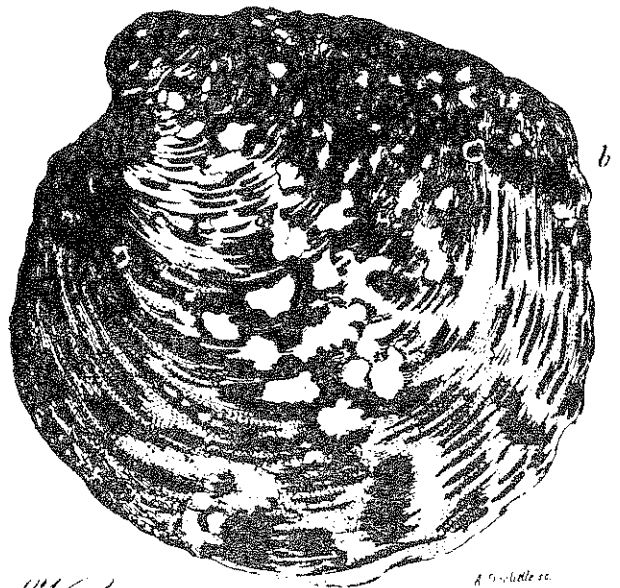
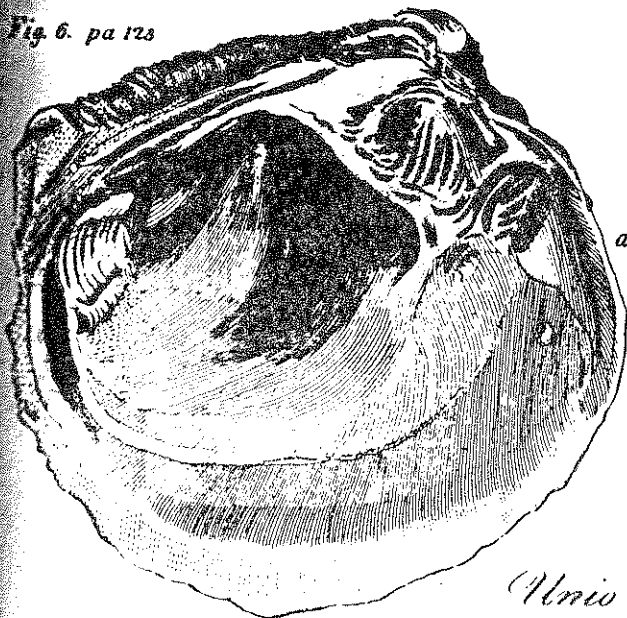


Unio Plicatus.

Unio Undatus.

Unio Cornutus.

Fig. 6. pa 123



Unio Verrucosus

A. S. S. S. S.

Mississippi, near Prairie du Chien.

Capt. Douglass.

Cabinets of the Lyceum and Dr. Mitchell.
My Collection. Mr. Say's Collection, Philadelphia.

Diam. 2.5 Length 3.5 Breadth 4.5.

Shell with the anterior side very broad, sub-truncate; posterior side rapidly narrowed; sub-angulated; disks very convex; umbones large, round, elevated; beaks recurved

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over the ligament; ligament large and prominent, passing under the beaks; anterior lunule depressed at the margin, fuscous, broad-heart-shaped, longitudinally waved; hinge margin depressed between the beaks; posterior slope carinate; epidermis yellowish olive, becoming chestnut brown on the umbones; rayed with green, more conspicuous in young specimens; in old ones the dark chestnut brown covers the whole and conceals the rays; surface smooth and shining, reflecting the face of the observer; young shells are splendid, having a much stronger lustre on the outside than on the inside; cardinal teeth broad, prominent and obliquely flattened; lateral teeth broad, elevated and terminating abruptly before; cicatrices large; cavity of the beaks unusually large; naker pearly white; surface smooth, but not highly polished.

REMARKS. -- There is a remarkable uniformity in the dimensions of the full-grown specimens of this species. This shell is more capacious than any other of the genus hitherto described. It most resembles the *unio ovatus*, but its greater capacity, darker color, its smooth, shining and rayed surface will distinguish it without mistake.

Variety (a) shell broader, less ovate, nearly oval and rounded on both sides.

A fine large shell. It measures

Diam. 2.3-2.8 Length 3.1-3.8 Breadth
4.1-5.4.

Inhabits the Wisconsin. Mr. Schoolcraft.

Variety (b) shell with the teeth slightly elevated; cardinal one formed by a serrated edge

of the shell, and a slight projection within.

Inhabits Barbadoes Neck, N. J. near New-York.
Mr. Bradhurst's Collection.

Diam. 2.5 Length 3.5 Breadth 4.8.

Variety (d) a shell from the Delaware approaches this species. The form and colour are similar. It is however less, the largest measuring scarcely 2.3 inches broad; making the shell not more than one fifth the size of those described above; also the beaks and bosses are less promi-

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nent, the rays fewer, and the polish less brilliant. It approaches the *Unio Cariosus*.

Inhabits the Delaware at New Hope. Mr.

J. Sears.

My Collection.

REMARKS. -- With the most respectful deference to the two distinguished Naturalists whose names are mentioned above, I have ventured to differ from them both, as they do from each other. I think a slight examination of our Cabinets would convince either of them that this shell requires a separate designation. Two bivalves can scarcely be more unlike than this and the *Unio Radiata* of Lamarck; and the recent discovery, of the variety C, in our own waters, which produce thousands of the *Unio Cariosus*, seems conclusive as to that. This variety it will be observed has precisely the same diameter and length as the shell from the Wisconsin, and the difference in the teeth may be accidental. There is the same necessity for distinguishing these as any others. They are totally unlike.

21. *Unio SILIQUOIDEUS*. Fig. 15. { outline of
the
shell.

Shell long-ovate, sub-cylindrical, thick, regularly rounded, rayed, beaks slightly elevated, cavity small; inside white.

Inhabits the Wisconsin. Capt. Douglass.

Dr. Mitchell's Cabinet. My Collection.

Diam. 1.3-1.6 Length 1.8-2.1 Breadth
3.3-3.8.

Shell elongated transversely, disks swelled;

beaks about one fourth from the posterior extremity; hinge margin straight; basal margin convex depressed; anterior margin rounded; posterior sub-angulated; epidermis yellowish olive rayed with distant dark green narrow lines; surface deeply wrinkled, and somewhat imbricated; striae dark and lamellar on the anterior slope; smooth and bright on the centre of the disks; cardinal teeth elevated crest-like compressed, and very oblique; in some specimens nearly parallel to the edge of the shell; lateral teeth long and

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straight; cavity of the beaks small and rather shallow, naker pearly white and iridescent, surface smooth and polished.

Variety (a) shell less, more ovate, broader before, hinge margin more elevated.

REMARKS. -- This is a beautiful and elegantly formed shell. It somewhat resembles a

pea-pod; hence its name. It agrees in color and surface with the *Unio Ventricosus*, but differs in being of smaller size, longer in proportion, more cylindrical, less inflated, beaks much less elevated, and cavity less capacious.

22. *UNIO OVATUS*. -- Shell roundish-ovate, convex, umbones elevated, beaks recurved, anterior lunule flattened; teeth crest-like elevated.

Unio Ovatus. Mr. Say.

Unio Ovata. M. Lamarck.

Inhabits the Ohio. Mr. Collins.

Maumee, at Fort Wayne. Mr. Sears.

Mr. Collins' Collection. My Collection.

Diam. 1.6-2.0 Length 2.3-3.0 Breadth
3.3-4.0.

American Conchology, plate 2, fig. 7.

Shell usually broader before, and narrower behind the beaks; but in the figure referred to above, the contrary is observed; thin when young, and not remarkably thick when old; disks swelled; umbones prominent; ligament partly concealed;

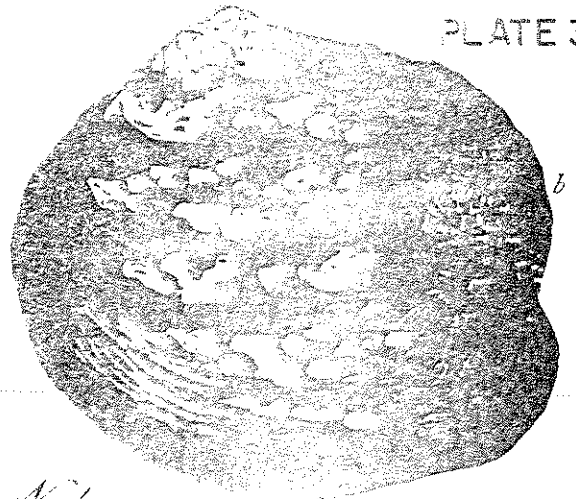
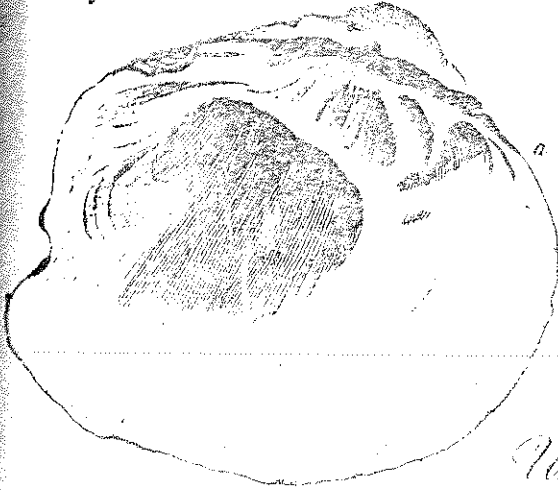
EXPLANATION OF PLATE 3, OPPOSITE PAGE

Unio Nodosus (two upper figures). Page 124 of original text.
Plate 6, Figs. 7a, b, of original.

Unio Tuberculatus (two lower left-hand figures). Page 125 of original text.
Plate 7, Figs. 8a, b of original.

Unio Rugosus (two lower right-hand figures). Page 126 of original text.
Plate 8, Figs. 9a, b of original.

Fig. 7. *pa.* 124.



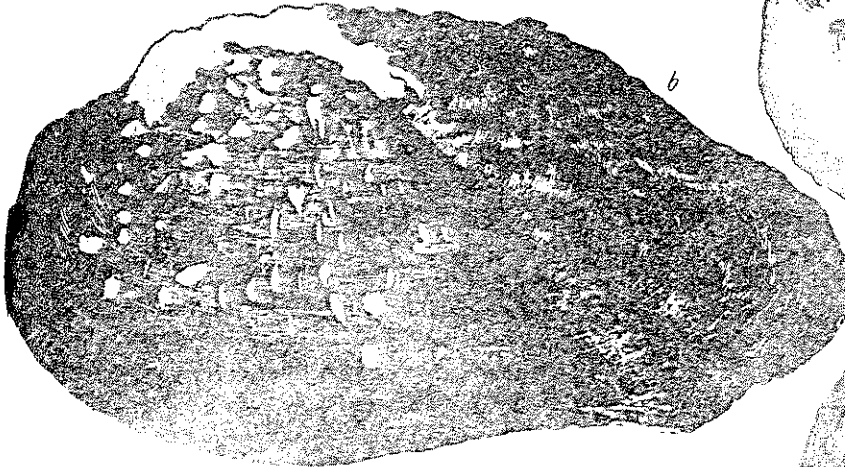
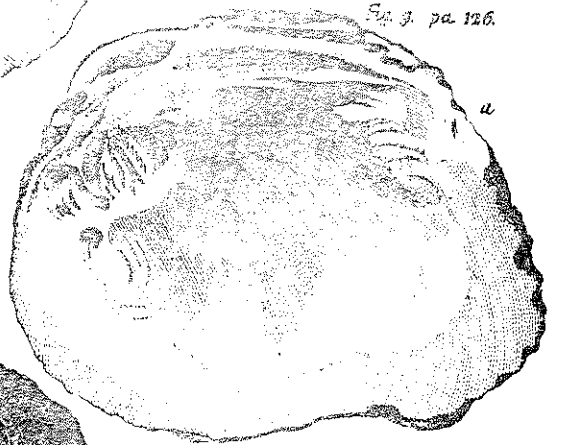
Unio nudus

Fig. 2. *pa.* 125.

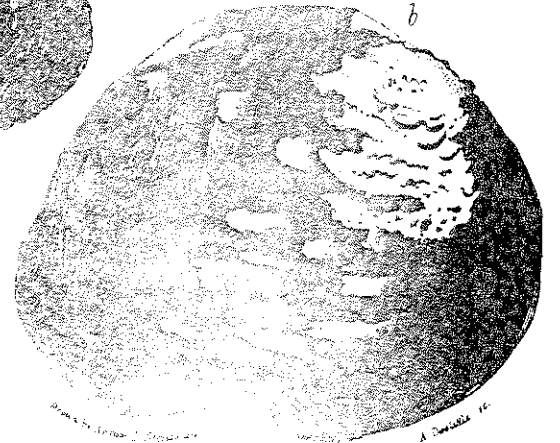


Unio rugosus

Fig. 3. *pa.* 126.



Unio tuberculatus



anterior lunule flattened, and fuscous, somewhat waved with striae and wrinkles becoming lamellar; hinge margin making an angle with the anterior and posterior dorsal; epidermis yellowish, or horn color; surface glabrous, deeply wrinkled, wrinkles appearing on the inside; cardinal teeth crest-like, elevated and compressed; lateral teeth elevated; in some specimens, short, crooked, and apparently deformed; in others, straight; cicatrices smooth and polished; cavity large and rendered somewhat angular by the flattening of the anterior slope; naker pearly, bluish white; surface, in old specimens, papilous, in young, smooth.

REMARKS.-- The angular appearance produced by the flattening of the anterior slope, readily distinguishes this

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species. It most resembles the *Unio Ventricosus*; but is less, thinner, "more flattened and even slightly concave on the anterior slope, from the oblique carina to the angle at the termination of the ligament." Mr. Say says the *Ovatus* is not rayed, and our specimens accord with his description, but M. Lamarck mentions a variety with rays from Lake George.

23. *UNIO CARIOSUS*.-- Shell ovate or oval, inflated, not very thick, beaks somewhat prominent, cavity moderate.

Unio Cariosus. Mr. Say.

Unio Cariosa. M. Lamarck.

Inhabits Lakes and Rivers of N. America.

My collection.

Diam. 1.6, Length 2.3, Breadth 3.7.

American Conchology, plate 3, fig. 2.

The dimensions and description of this shell vary so much that it is difficult to find a sufficient number of permanent characters by which it may be distinguished. It resembles in this respect the *Unio Purpureus*; for of the twelve characters mentioned by Mr. Say, and the six mentioned by M. Lamarck only four can be considered as in any degree permanent; and of these M. Lamarck has mentioned but one, and that is

"inflated." The colour, form and size of the shell constantly vary. It is commonly broader before, but often equally broad at both extremities; and somewhat pointed. It is never very thick; often very thin; commonly a medium. Those from the Hudson are thin and small, from the Raritan thicker and broad; from the western waters middle sized and of considerable thickness; disks swelled, umbones elevated; ligament exterior and elevated; epidermis olive-brown or greenish, and commonly radiated. Internal colour bluish white, reddish, rose, or salmon; surface often warty.

Variety (a) Cardinal teeth multipartite.

Inhabits Lake Ontario.

Mr. Bradhurst's Collection.

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24. *UNIO PLANUS*. Fig. 16. outline of the shell.

Shell rhombick-oval, thin, beaks depressed; disks flattened, compressed; teeth slightly elevated, smooth.

Inhabits the Wisconsin. Mr. Schoolcraft.

My Collection.

Diam. 1.3 Length 2.8 Breadth 4.8.

Shell with the beaks flat, ligament broad and deeply inserted between the valves; hinge margin straight and parallel to the base; basal margin slightly arcuated; anterior dorsal margin subtruncate; epidermis brownish yellow; surface deeply wrinkled; cardinal teeth smooth, polished and slightly elevated; lateral teeth long and slender; cicatrices rough; cavity very small; naker bluish white tinged with purple and green. Internal surface wavy and tuberculated.

REMARKS.-- The flatness of the shell and the smoothness of the teeth, readily distinguish this species from all its congeners hitherto described. It has been supposed to be the *Unio Anodontina* of M. Lamarck; but besides being four times as large, it has not at all the general habit of an *Anodonta*; whereas M. Lamarck observes that his shell "might be mistaken for an *anodonta* unless it should be carefully observed."

**** Cardinal teeth small, oblique.

25. UNIO TRIANGULARIS. { a inside.
Fig. 17. { b outside.

Shell triangular, gibbous inflated, rayed, gaping; anterior slope flattened, ribbed, cancellate; inside white.

Inhabits Bois-blanc Isle, Detroit River.

Major Delafield.

Dr. Mitchill's Cabinet.

Major Delafield's Collection.

My collection.

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Of this remarkable shell we have four specimens;

| | | | | | |
|-------|------|--------|------|---------|------------|
| Diam. | .6 | Length | .625 | Breadth | 1.05 inch. |
| | .625 | | .7 | | 1.1 |
| | .75 | | .8 | | 1.5 |
| | .8 | | .8 | | 1.3 |

Shell moderately thick, acutely angulated before obtuse and somewhat angulated behind; disks inflated; anterior slope flattened and forming a right angle with the disk, ribbed longitudinally and wrinkled transversely; beaks one

third from the posterior extremity, decorticated approximate and somewhat elevated; anterior lunule oval-heart-shaped; posterior lunule not distinct; basal margin a little depressed near the anterior extremity; anterior margin straight, and its edge not entire; epidermis yellowish-green, rayed with dark green, finely striated transversely, and with from three to six more conspicuous transverse wrinkles. Anterior slope marked with longitudinal ribs which are beautifully cancellated by the striae and wrinkles passing over them, ribs projecting and forming a dentated edge; shell slightly gaping at both extremities; cardinal teeth two in each valve, compressed and crenulate, lamellar teeth short, projecting, finely crenulate, and terminating abruptly; naker bluish white iridescent.

REMARK. -- This shell resembles, in shape, the *Alasmodonta marginata*, but is a well characterized *Unio*.

26. UNIO NASUTUS. -- Shell oblong-lanceolate, thin produced and pointed before, hinge margin elevated, compressed, carinate.

Unio Nasutus, Mr. Say.

American Conchology, plate 4, fig. 1.

EXPLANATION OF PLATE 4, OPPOSITE PAGE

Unio Gibbosus, (upper left-hand figure). Page 262 of original text.
Plate 11, Fig. 12 of original.

Unio Carinatus (lower left-hand figure). Page 259 of original text.
Plate 11, Fig. 10 of original.

Alasmodonta Arcuata (young) (upper right-hand figure). Page 277 of original text.
Plate 12, Fig. 20 of original.

Alasmodonta Arcuata (old) (lower right-hand figure). Page 277 of original text.
Plate 12, Fig. 20 of original.

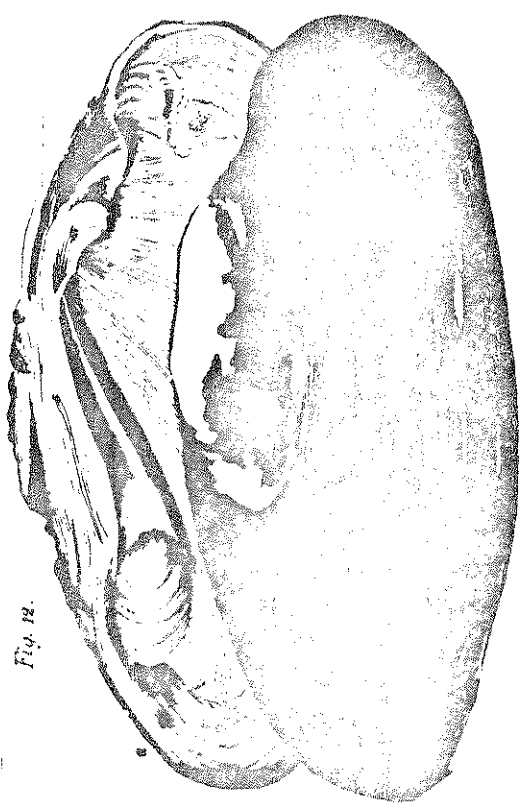


Fig. 12.

Urosalpinx gibbosa

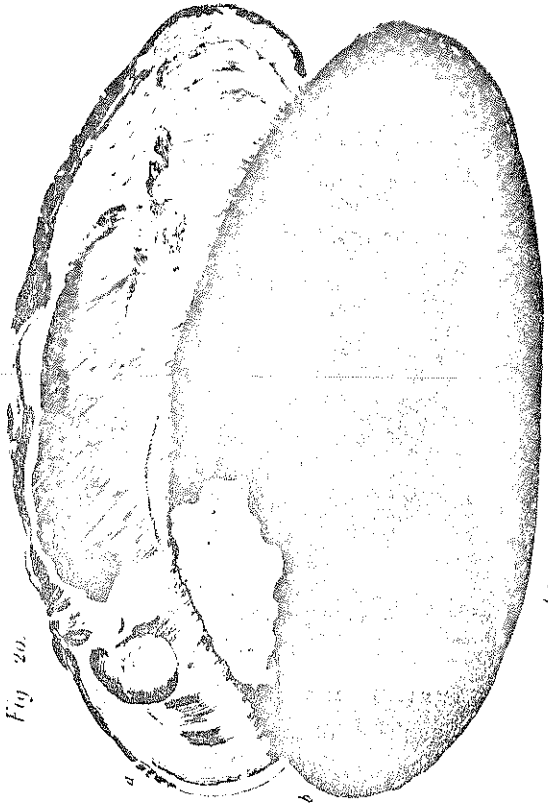


Fig. 20.

Urosalpinx brenata (young)

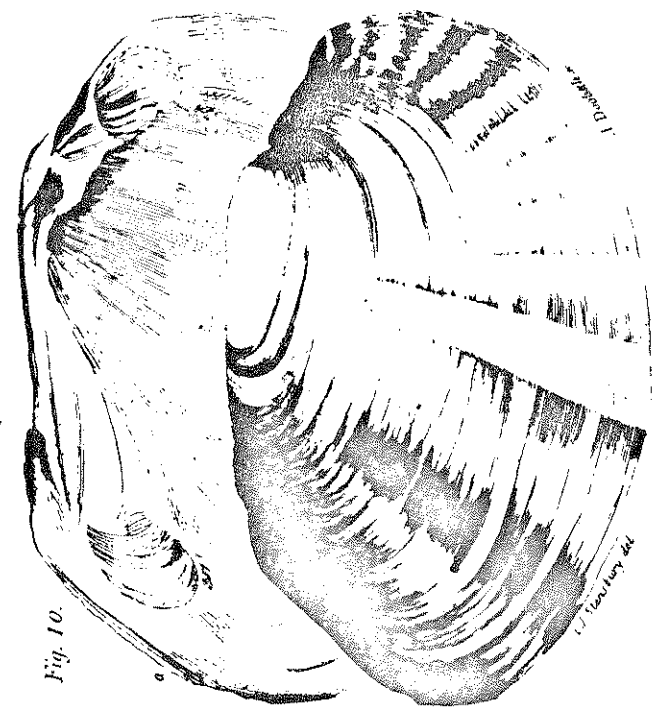


Fig. 10.

Urosalpinx carinata



Fig. 20.

Urosalpinx arnuta (old)

Inhabits the Delaware.

My Collection.

Diam. .5 Length 1.0 Breadth 2.2

Shell thin and slender; disks compressed; beaks depressed; ligament elevated and slender; anterior lunule distinct, somewhat depressed at the margin, and with obsolete longitudinal ribs; hinge margin straight; basal margin nearly parallel with the hinge, slightly divergent; anterior

(page 274)

extremity pointed, posterior rounded; epidermis greenish brown; surface striated, glabrous; cardinal teeth slender; lateral tooth long and thin; naker bluish-white varied with wax-yellow, and sometimes tinged with violet, and iridescent; cavity of the beaks, scarcely any.

REMARK. -- This cannot as M. Lamarck supposed be his Unio Nasuta, for it has no sinuses on the basal margin, is not "crooked" nor "obliquely attenuated."

27. UNIO GRACILIS. -- Shell ovately triangular, very thin and fragile, hinge margin elevated; valves connate; ligament concealed.

Unio Alatus. Mr. Say.

Inhabits the Wisconsin. Mr. Schoolcraft.

And the Lakes. Mr. Say.

Cabinet of the Lyceum.

My Collection.

Diam. 1.0-1.2 Length 2.2-2.5 Breadth 3.1-4.1.

Beaks depressed, and placed far back; ligament between the valves, and covered; anterior lunule distinct and obsoletely ribbed; hinge margin elevated into a large wing; epidermis sea-green, wrinkled and striated transversely; obscurely radiate and glabrous; cardinal teeth very small, scarcely projecting; lateral teeth very thin and finely striated; channel just sufficient to admit the point of the thumb nail; naker bluish-white tinged with violet, and beautifully iridescent.

REMARKS. -- This shell differs from Unio

Alatus in being much thinner, broader in proportion, lighter color both inside and outside, produced and somewhat pointed behind; anterior slope in a straight line with the alated projection. It differs entirely in the shape and proportion of the teeth.

28. UNIO PARVUS. Fig. 18. } outline of the shell.

Shell oblong-ovate, small, convex, sides rounded; beaks slightly elevated, inside pearly white, iridescent.

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Inhabits the Fox River. Mr. Schoolcraft.

Cabinet of the Lyceum.

Mr. Collins's Collection.

Mr. Say's Collection, Philadelphia.

Diam. .35-.525 Length .4-.6 Breadth .75-1.2

Shell rather thin, beaks placed about one fourth of the length from the posterior extremity, ligament very narrow, anterior lunule distinct and obsoletely ribbed; basal margin slightly shortened; epidermis brownish; an obtuse slightly elevated rib from the beaks to the anterior basal margin; lateral tooth rectilinear rounded at the end, and parallel to the base; naker very brilliant.

REMARK. -- The smallest and most beautiful of all the genus yet discovered in America.

Summary of the Unio.

| | |
|--------------------------------------|----|
| Species described, - - - - - | 28 |
| Varieties particularized, - - - - - | 23 |
| | — |
| Total of species and varieties, | 51 |
| | — |
| Of which Mr. Say formerly described, | 8 |
| We have given new specific names to | 20 |
| Of which M. Lamarck had perhaps | |
| previously noticed - - - - - | 3 |

End of the Unio.

ALASMODONTA. °

Generick Character.

Shell transverse, equivalve, inequilateral, free; beaks decorticated; posterior muscular impression compound; hinge with prominent cardinal teeth in each valve, but without lateral teeth.

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OBSERVATIONS

This genus was established by Mr. Say. The shells are distinguished from those of the genus *Unio*, by the want of the lateral lamellar tooth, the place of which is commonly occupied by a slightly elevated fold; but no channel can be perceived, nor any interlocking or matching together of the opposite folds. In many specimens "From α , without, $\lambda\alpha\sigma\mu\alpha$ ($\lambda\epsilon\tau\tau\iota\sigma\mu\alpha$?) a scale, and $\sigma\delta\alpha\sigma$ tooth." -- Mr. Say.

the part is perfectly smooth. The sinus at the anterior termination of the ligament is visible in all, and exactly resembles that of the *Unio*; as do also the colours of the epidermis and of the interior; but the polish of the inside is generally much less brilliant than that of the *Unio*. The habit of the shells is similar, many of them becoming thick and large.

Mr. Lamarck seems not to have noticed this genus. He makes the same remark of his *Hyria*, °

° Generick character of the *Hyria* of M. Lamarck. Shell equivalve, obliquely triangular, auriculate, truncated and straight at the base; hinge with two teeth slightly elevated; (rampantes.) the cardinal or posterior tooth multipartite, divergent, the interior parts less; the other or lateral tooth very long and lamellar; ligament external and linear. (Naker very brilliant.)

EXPLANATION OF PLATE 5, OPPOSITE PAGE

Unio Praelongus (upper left-hand figure). Page 261 of original text.
Plate 13, Fig. 11 of original.

Unio Ventricosus (next lower left-hand figure). Page 267 of original text.
Plate 13, fig. 14 of original.

Unio Planus (second lowest left-hand figure). Page 272 of original text.
Plate 13, Fig. 16 of original.

Unio Parvus (lowest left-hand figure). Page 274 of original text.
Plate 13, Fig. 18 of original.

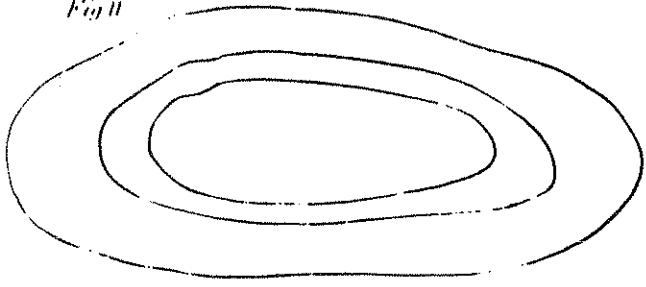
Unio Mucronatus (upper right-hand figure). Page 266 of original text.
Plate 13, Fig. 13 of original.

Unio Siliquoides (next lower right-hand figure). Page 269 of original text.
Plate 13, Fig. 15 of original.

Unio Triangularis (second lowest right-hand figure). Page 272 of original text.
Plate 13, Fig. 17 of original.

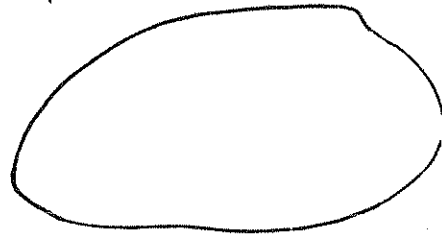
Unio Ellipticus (lowest right-hand figure). Page 259 of original text.
Plate 13, Fig. 19 of original. The vertical line on the right-hand side of the figure was caused by a fold in the plate copied.

Fig 10



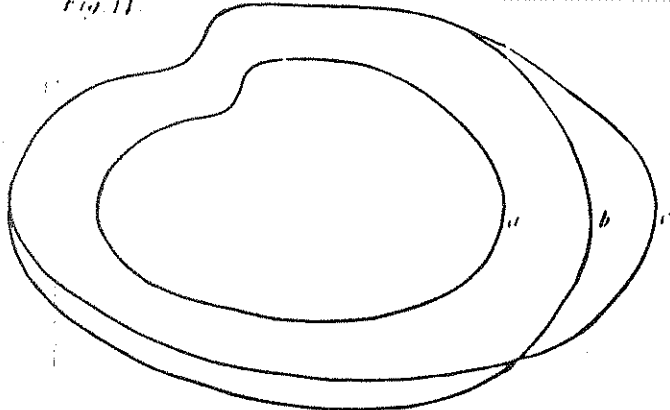
Unio - Prolongus

Fig 13



Unio. Minimus

Fig 11



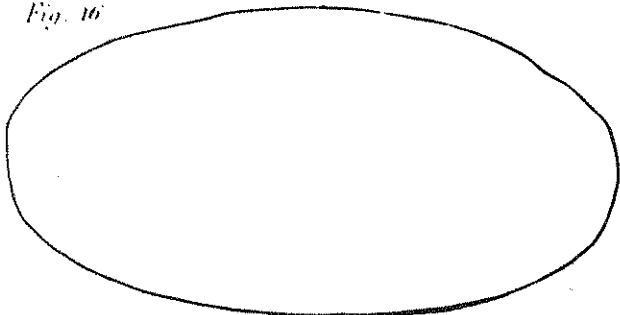
Unio Ventricosus

Fig 14



Unio. Idiognathus

Fig 16



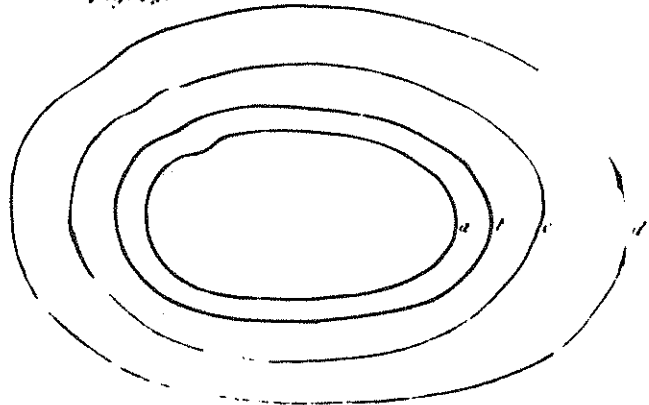
Unio - Lunus

Fig 17



Unio. marginatus

Fig 19



Unio ellipticus

Fig 18



Unio - Lunus

that Mr. Say does of this, "that together with the *Dipsas* † of Dr. Leach it completes the connexion between the *Unio* and *Anodonta*." But no part of his generic character agrees with the present genus except that the shell is equivalve, which is the case in the whole family.

The auricles ‡ of his *Hyrria* and the lamellar tooth forbid the supposition, that he could have intended this shell by his description. It is however properly one of his *Naiades*, and should be placed next to the *Unio*.

We subdivide the Genus in two sections, commencing with those that resemble the *Unio* and ending with those that approach the *Anodonta*.

Sections.

- ° Shells thick and large.
- °° Shells thin and small.

(Footnotes below are on page 276. Ed.)

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- ° Shells thick and large.

Species.

1. *ALASMODONTA ARCUATA*. { a. young c. old.
 FIG. 20. { b. d.

Shell ovate, elongated transversely, thick; base arcuated; ligament elevated; beaks depressed; cicatrices rough.

Hab. West Canada Creek. Mr. R. N. Havens.

A small stream in Tappan. Mr. J. Sears.

Cabinets of the Lyceum and Dr. Mitchill.

My Collection. Mr. Say's Collection.

Diam. 1.2-1.6 Length 2.1-2.6 Breadth
 4.1-5.5

† The *Dipsas* of Dr. Leach, has the lamellar lateral tooth, but no cardinal teeth.

‡ Processes on each side of the beaks, like the scallop, *Pecten opercularis*.

Shell thick; disks convex above, and compressed below; anterior side very much produced; beaks slightly elevated; ligament elevated above the beaks; hinge margin elevated, compressed, carinate; basal margin arcuated; anterior margin narrow and somewhat pointed; posterior margin rounder and broader than the anterior; ant. dorsal margin rapidly narrowed and subtruncate; post. dorsal impressed behind the beaks; epidermis brownish black; surface, in young specimens, smooth and glabrous, in old ones, much eroded, scabrous and broken. Teeth two in the right and one in the left valve, triangular, elevated and crenate; muscular impressions rough; cavity of the beaks small; naker bluish white, on the fore parts, lightly iridescent, the rest dull. Young specimens have the center of a pale flesh colour, and the old ones are frequently marked with irregular greenish spots.

REMARKS. -- The remarkable change in the form of this species by age, as represented in the figures, might induce an observer to suppose that the shells belonged to different species; but the specimens in our collections of every variety of form, from those that are straight or even slightly rounded on the base, to those that are deeply arcuated, show clearly that they all belong to the same species. It is surprising that a shell so large, and frequently occurring in our waters should so long have been overlooked. This has

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probably arisen from the supposition that it belonged to the genus *Unio*, as in its exterior it resembles some varieties of the *U. purpureus*.

2. *ALASMODONTA RUGOSA*. -- Fig. 21. Shell oblong-oval, anterior side with deep divergent folds.

Hab. Wisconsin. Capt. Douglass.

Fox River. Mr. Schoolcraft.

Dr. Mitchill's Cabinet. My Collection.

Mr. Say's Collection.

Diam. 1.0 Length 2.0 Breadth 3.7

Shell oblong-oval, about equally broad before and behind; beaks slightly elevated, wrinkled and decorticated, exhibiting a wax colour beneath; ligament external and as high as the beaks; anterior lunule distinct with a slightly elevated ridge extending from the beaks to the ant. basal margin; basal margin a little shortened; the other margins regularly rounded; epidermis chestnut brown, with a silky lustre, surface of the anterior part folded in a pinnate form; folds deeper above and somewhat obsolete below the ridge, curved upward and extending to the hinge and anterior margins, indenting the edge and visible on the interior. Teeth large and elevated with a fold behind; cicatrices smooth; cavity small; naker pale flesh coloured in the center, pearly white on the margin with a narrow border of dark chocolate colour; surface smooth and glabrous.

REMARKS. -- This is a very beautiful shell, and unlike any of its congeners. In the one figured, the left valve is slightly compressed, the right a little gibbous and the base crooked, which may perhaps be accidental.

3. *ALASMODONTA COMPLANATA*. Fig. 22. Shell ovately quadrangular, hinge margin elevated into a large wing; valves connate; ligament concealed.

Hab. Fox River. Mr. Schoolcraft.

Wisconsin. Capt. Douglass. (***) Cabinets of the Lyceum, and Dr. Mitchell. My collection. Mr. Say's collection.

(***) Page 278 ends with this line. Page 279 begins with "Cabinets . . ." Space omitted in printing. Ed.

Diam. .9-1.4 Length from beaks to base 3.0
Breadth 5.0 Length from the top of the wing 4.3-4.5

Shell very short behind; disks much flattened; umbones depressed; beaks slightly projecting; ligament between the valves; anterior lunule much compressed and folded across the transverse wrinkles; hinge margin elevated into a large wing, straight and forming an obtuse angle with the post. dorsal margin; basal margin slightly rounded, nearly straight; anterior and posterior margins somewhat angulated; anterior dorsal margin arcuated, or somewhat emarginate; epidermis chestnut brown, glossy; surface somewhat deeply wrinkled and striated transversely; slightly elevated ridges and furrows diverging from the beaks to the anterior margin, and distinctly impressing the inside. Teeth elevated, sulcated and radiating from the beaks; cicatrices smooth; cavity small and angular; naker bluish white and iridescent; surface smooth, and polished, in old specimens spotted with green.

REMARKS. -- This shell resembles the *Unio Alatus*, in the elevation of the wing and the connexion of the valves, and might at first sight be mistaken for a variety of that species; but it differs in generic character, in shape, and in colour.

** Shells thin and small.

4. *ALASMODONTA MARGINATA*. -- See Mr. Say's description.

5. *ALASMODONTA UNDULATA*. -- See Mr. Say's description and figure.

EXPLANATION OF PLATE 6, OPPOSITE PAGE

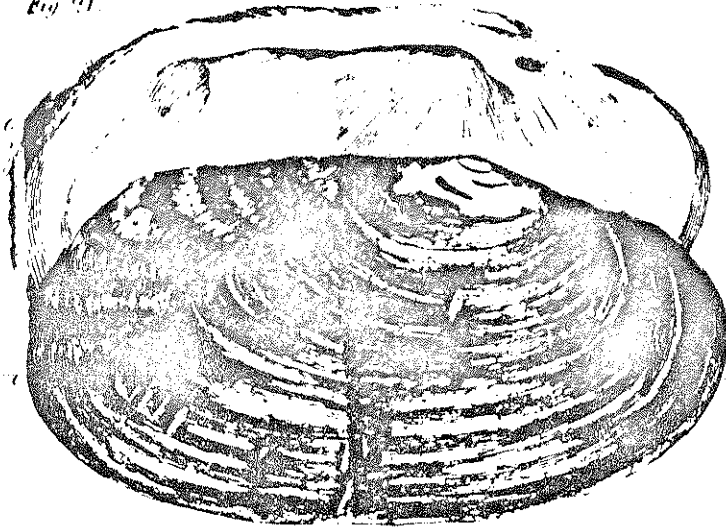
Alasmodonta Rugosa (upper figure). Page 278 of original text.

Plate 13, Fig. 21 of original. The black line down the middle of the figure was caused by a fold in the plate copied.

Alasmodonta Complanata (lower figure). Page 278 of original text.

Plate 13, Fig. 22 of original. The black line down the right-hand side of the figure was caused by a fold in the plate copied.

Fig 21.



Musculodonta rugosa

Fig 22.



Musculodonta complanata

These two species were the only ones known when Mr. Say published his description. The former of them is very common and assumes a great variety of forms and colours. Those that were brought by the N. W. Expedition are larger than those of our eastern waters. They have the epidermis pale green, rayed; they are gibbous; have the beaks elevated, and base falcated.

Diam. 1.0 Length 1.4 Breadth 2.4

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Our thanks are due to the following gentle-

men, for specimens and information.
 Gov. Cass of the Michigan Territory.
 Capt. D. B. Douglass, Topographical
 Engineer to the N. W. Expedition.
 Mr. H. R. Schoolcraft, Mineralogist to the
 N. W. Expedition.
 Mr. Thomas Say, Philadelphia.
 Doctor S. L. Mitchill, }
 Major Delafield, }
 Mr. S. B. Collins, } of New-York.
 Mr. J. M. Bradhurst, }
 Rev. J. Sears, }
 Mr. R. N. Havens, }
 Mr. E. Norcross, of the American Museum.

REPRINTS OF RARE PAPERS ON MOLLUSCA. -- ELKANAH BILLINGS ON
 LAND SNAILS OF THE MOUNTAIN OF MONTREAL. (Canadian Naturalist and Geologist, 2: 97-101, figs. 2-6, 1857).

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4. TERRESTRIAL MOLLUSCA. While turning over the stones in search of geological specimens, I found during a single visit to the mountain no less than five species of land shells. Three of these were easily determined - a fourth appears to be a described

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species, but of the fifth I can find no account, and it may be new. These two must, therefore remain unnoticed for the present.

(Figs. 2 and 3)

Figs. 2 and 3. - *Helix Albolabris* (Say)
 (The White Lipped Helix.) Montreal Mount-

ain, 24th April, 1857.

In the above two figures the largest and most common species is represented, and the following is the description given in Gould's *Invertebrata of Massachusetts*.

(Quotation from Gould omitted here)

This is one of the most abundant of the few species of snails found in Canada. In all newly cleared lands the whitened shells of dead specimens are everywhere to be met with and living ones may be procured by searching under decaying logs, rotten stumps or stones. Limestone cliffs overgrown with small trees and herbage are more especially favoured haunts of this species. Dr. Gould remarks:

"This is our largest snail, and, though so simple in its structure and coloring, is a